I Claim:

1. A thin film filter for dense wavelength division multiplexing, the thin film filter comprising:

   a glass substrate;

   a film stack mounted on the glass substrate, the film stack comprising low refractive index thin films and high refractive index thin films, each of the high refractive index thin films comprising a composition of indium-tin oxide.

2. The thin film filter as described in claim 1, wherein the substrate is made of material selected from the group consisting of glass, quartz, optical plastic, silicon, and germanium.

3. The thin film filter as described in claim 1, wherein the film stack comprises a plurality of cavities.

4. The thin film filter as described in claim 3, wherein each of the cavities comprises a first group of mirror layers, a second group of mirror layers, a spacer layer, and a coupling layer.

5. The thin film filter as described in claim 4, wherein each of the first and second groups of mirror layers comprises a plurality of low refractive index thin films and high refractive index thin films.

6. The thin film filter as described in claim 4, wherein the spacer layer has an optical thickness of an integer times one-quarter of a central wavelength of a pass bandwidth of the thin film filter.

7. The thin film filter as described in claim 1, wherein a range of the composition of indium-tin oxide is from 20% indium oxide plus 80% tin oxide to 17% indium oxide plus 83% tin oxide.

8. The thin film filter as described in claim 5, wherein the low refractive index thin films comprise silicon dioxide (SiO_2) or aluminum oxide (Al_2O_3).

9. The thin film filter as described in claim 5, wherein the low refractive index thin films and the high refractive index thin films are alternately deposited one on another.

10. The thin film filter as described in claim 5, wherein each of the low refractive index thin films and each of the high refractive index thin films has an optical thickness equal to one-quarter of a central wavelength of a pass bandwidth of the thin film filter.

11. A thin film filter for dense wavelength division multiplexing, the thin film filter comprising:

a glass substrate; and

a film stack mounted on the glass substrate, the film stack comprising low refractive index thin films and high refractive index thin films; wherein

each of the high refractive index thin films owns a refractive index of about 2.1, and numbers of layers in five cavities are about 160.